

Rock Creek Watershed Restoration Action Plan

July 2001



Prepared for
Montgomery County Department of
Environmental Protection



by the
Center for Watershed
Protection



in cooperation with
URS Corporation



Montgomery County's Water Quality Goals

Montgomery County has a rich and diverse natural heritage, which includes over 1,500 miles of streams that provide habitat vital to aquatic life. To preserve this natural heritage, the County has adopted a Countywide Stream Protection Strategy with the following water quality goals:

- Protect, maintain, and restore high quality chemical, physical, biological, and stream habitat conditions in County streams that support aquatic life and uses such as recreation and water supply
- Restore County streams damaged by inadequate stormwater management practices of the past by re-establishing the flow regime, chemistry, physical conditions and biological diversity of natural stream systems as closely as possible through improved stormwater management practices
- Work with other jurisdictions to restore and maintain the integrity of the Anacostia River, the Potomac River, the Patuxent River, and the Chesapeake Bay
- Promote and support educational and volunteer initiatives that enhance public awareness and increase direct participation in stream stewardship and the reduction of water pollution

What is the Countywide Stream Protection Strategy?

The Montgomery County Department of Environmental Protection (MCDEP) developed the Countywide Stream Protection Strategy (CSPS) in 1998. The goal of the CSPS is to preserve, protect, or restore **watersheds*** by evaluating County stream resource conditions, and identifying programs for responding to problems on a **subwatershed** basis.

A countywide stream assessment was done based on evaluation of aquatic life and stream channel habitat indicators in addition to typically applied stream chemistry measurements from over 200 monitoring stations. Nearly all Montgomery County streams meet Maryland water quality standards and criteria for dissolved oxygen, temperature, and pH. However, the extent and diversity of biological life and stream habitat conditions vary significantly.

Montgomery County Stream Resource Conditions	Stream Miles	Percent Stream Miles
<i>Excellent</i>	129	8
<i>Good</i>	680	46
<i>Fair</i>	391	26
<i>Poor</i>	143	9
<i>Data Collected, Under Analysis</i>	171	11
TOTAL	1514	100

The major impacts to habitat conditions and aquatic life are stream **erosion** and **sedimentation**. These impacts originate primarily from increased stormwater runoff from developed areas, as well as inadequate sediment control from construction sites and agricultural land. These impacts are related to the extent that developed land has replaced natural land cover with impervious areas such as roads, parking lots, driveways, and buildings. This development increases stormwater flows and reduces groundwater infiltration to the detriment of natural stream hydrology.

* Words in bold typeface are defined at the end of this publication in the glossary

For more information about the Countywide Stream Protection Strategy contact Keith Van Ness, Senior Water Quality Specialist at **240-777-7726** or go to the CSPS website at www.co.mo.md.us/dep/watersheds/csps/csps.html

Rock Creek Watershed

Rock Creek begins as a small spring emerging from a spring house in the Laytonsville area, and flows approximately 21 miles before entering the District of Columbia. Distinct geographic characteristics along the Route 28 corridor divide the Rock Creek watershed, and form the upper and lower watersheds of Rock Creek. This urban watershed is highly developed and densely populated in the lower portion, while the upper portion is moderately developed, with some remaining agricultural and open areas. The Upper Rock Creek watershed contains many miles of small headwater streams unlike Lower Rock Creek, where prior development piped many headwater areas, impacting aquatic habitat and stream systems. The high level of development and lack of stormwater controls have led to unmitigated flows that have damaged Rock Creek and its tributaries.



Typical stream section in Upper Rock Creek watershed

A stream valley park system exists along the **main stem** that connects to Rock Creek National Park in D.C., and provides recreational opportunities as well as a protective buffer along the mainstem and tributaries of Rock Creek. These parks create safe overflow areas for typical flooding events, preserve vernal pools and wetlands within the floodplain, and offer opportunities to establish restorative or control measures, which will also enhance the parks recreational value.



Typical stream section in the Donnybrook Tributary located in the Lower Rock Creek watershed

Rock Creek Watershed Map



Lakes Needwood and Frank, located within the Upper Rock Creek watershed, were originally constructed in the 1960's for flood control and recreation. These lakes provide significant water quantity control and water quality benefits such as sediment control.

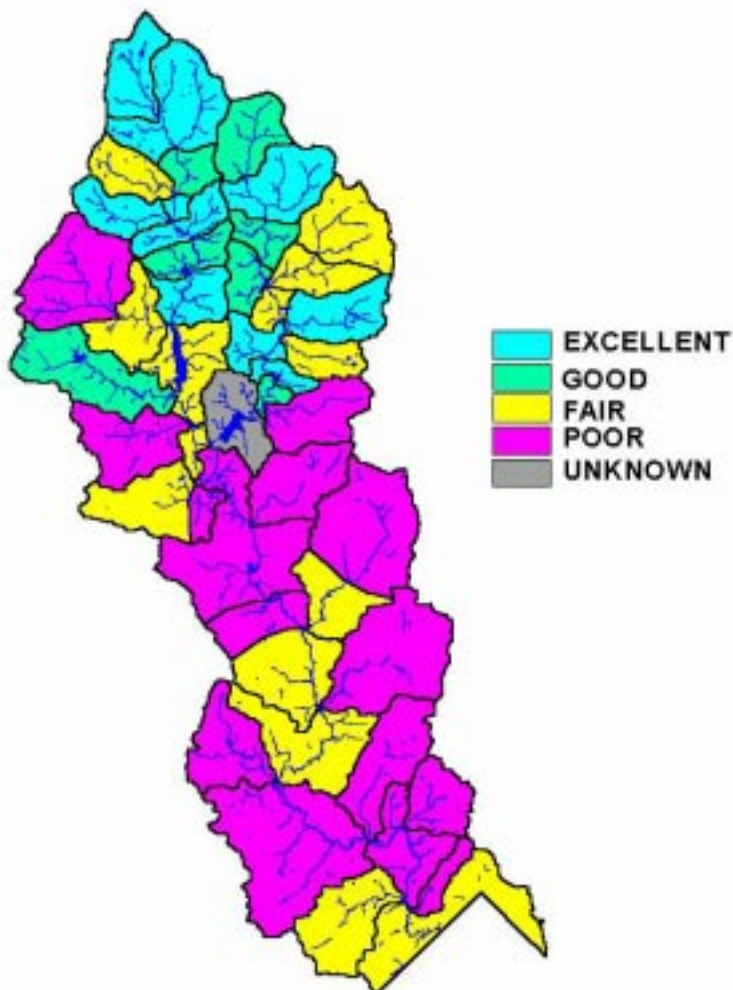
Why Restore Rock Creek?

Rock Creek is the second largest watershed in Montgomery County with a drainage area of approximately 60 square miles. Rock Creek and its tributaries flow into the Potomac River, and eventually to the Chesapeake Bay, which is one of the region's most important resources. The CSPA ranked stream conditions in Rock Creek as highly variable, ranging from excellent to poor. These results are shown in the tables below for upper and lower portions of the watershed and in the map below by subwatershed. Restoring Rock Creek will not only improve water quality, biological communities and stream conditions, but will also increase the aesthetic and recreational value for many people who utilize the Rock Creek watershed for active and passive recreation.

Upper Rock Creek Stream Resource Conditions	Stream Miles	Percent Stream Miles
<i>Excellent</i>	31.2	34
<i>Good</i>	21.1	23
<i>Fair</i>	20.7	23
<i>Poor</i>	15.4	17
<i>Data Collected, Under Analysis</i>	3.2	3
TOTAL	91.6	100

Lower Rock Creek Stream Resource Conditions	Stream Miles	Percent Stream Miles
<i>Excellent</i>	0	0
<i>Good</i>	0	0
<i>Fair</i>	17.4	27
<i>Poor</i>	45.9	73
<i>Data Collected, Under Analysis</i>	0	0
TOTAL	63.3	100

Rock Creek Subwatershed Stream Conditions



Watershed Impacts and Problems

Through the CSPA and field analyses, MCDEP revealed that the primary problems in the Rock Creek watershed are:

- Uncontrolled runoff from high stormwater flows due to large areas of **imperviousness** or hard surfaces (parking lots, roads, rooftops, etc.). Uncontrolled runoff has several impacts, including:

- Severe erosion contributing to unstable streambanks, increased sediment loads, and impaired instream habitat
- Undermining of stormdrain and utility infrastructure
- **Nonpoint source pollution** (discharges of fertilizers, household products, etc.)

- Fish passage problems for resident and **anadromous fish** species (permanent and partial barriers)

- Periodic spills, illegal discharges of pollutants, and leaky sewer infrastructure



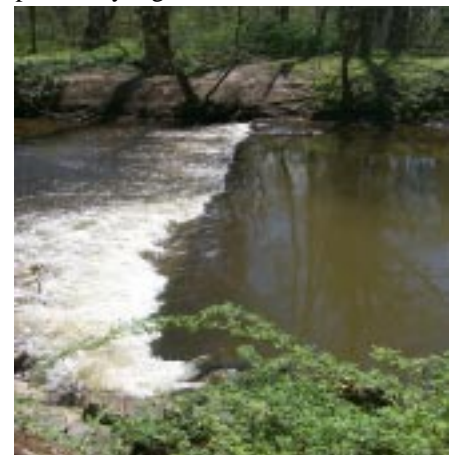
Bank erosion in Lower Coquelin Run



Trash and debris in Lower Donnybrook tributary deposited by high stormflows



Outfall in Lower Turkey Branch causing bank erosion and exposed tree roots (left)
Fish barrier prevents upstream migration in Rock Creek (right)



Rock Creek Watershed Feasibility Study

A Rock Creek Watershed Feasibility Study was undertaken to identify the most severe problem locations and assess opportunities for habitat and aquatic life restoration. This study provides the technical information necessary to develop this Rock Creek Watershed Restoration Action Plan that addresses the effects of uncontrolled stormwater or inadequate control of runoff from the landscape.

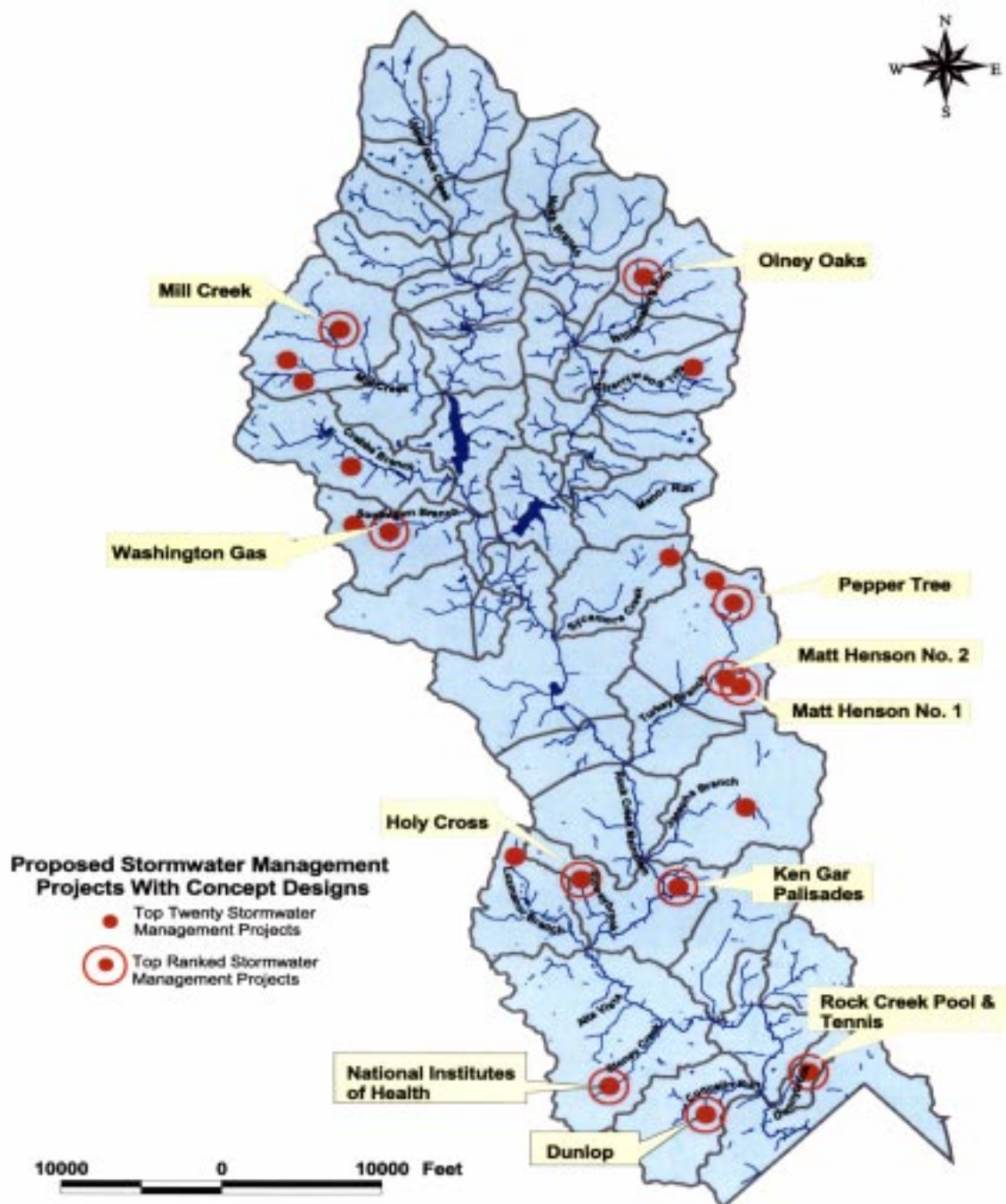
The Rock Creek Watershed Feasibility Study *identified, prioritized and designed stormwater management and stream restoration projects* in support of the County's watershed restoration program. The proposed **stormwater management** facilities should improve water quality conditions and decrease erosive velocities, while the stream restoration projects will provide erosion protection and ultimately improve habitat conditions. Together, these projects should reduce sediment loads in the streams of Rock Creek watershed.

This 4-part study used field data and hydrologic models to: evaluate subwatershed stream conditions, identify the best sites for stormwater management and stream restoration projects, evaluate Lakes Needwood and Frank, and perform a final watershed assessment.

Stormwater Management Projects in Rock Creek

Forty-eight potential stormwater management project sites were field investigated, and a technical scoring system was used to identify the top 20 sites in the watershed. Each site was ranked based on criteria such as pollutant load reduction, cost, feasibility, and environmental benefits. Each of the 67 subwatersheds in Rock Creek was then ranked according to criteria such as public support, length of severe channel erosion and percent of subwatershed with potential for stormwater control. The top ten sites were then selected based on the subwatershed priority ranking coupled with individual technical scoring analysis, and conceptual designs were created for these sites. The map below shows the locations of the top ranked stormwater management projects in the watershed.

Stormwater Management Project Sites



Stormwater Management Project Descriptions

Three types of stormwater management projects were used in the conceptual designs: stormwater ponds, stormwater wetlands, and sand filters. These projects were either new or **retrofit** designs.

<u>Proposed Site</u>	<u>Subwatershed Location</u>	<u>Description</u>
Dunlop	Coquelin Run	New Stormwater Pond
Holy Cross	Lower Main Stem Ken Gar	New Stormwater Wetland
Ken Gar Palisades	Ken Gar Branch	New Stormwater Wetland
Matt Henson No. 1	Turkey Branch	New Sand Filter
Matt Henson No. 2	Turkey Branch	New Stormwater Pond
Mill Creek	Mill Creek	Stormwater Pond Retrofit
National Institutes of Health	Lower Main Stem Bethesda	New Stormwater Pond
Olney Oaks	Williamsburg Run	Stormwater Pond Retrofit
Pepper Tree	Turkey Branch	Stormwater Pond Retrofit
Rock Creek Pool and Tennis	Donnybrook Tributary	New Stormwater Pond
Washington Gas	Southlawn Branch	New Stormwater Pond

Stormwater Ponds

Stormwater ponds provide water quantity and quality control by storing stormwater, which reduces downstream flooding and erosion, and by allowing pollutants to settle. Ponds can be designed to control specific size storms, to detain a portion of stormwater runoff for up to 24 hours after a storm, and to trap incoming sediment where it can easily be removed. Ponds also provide aesthetic value and habitat when planted with emergent wetland vegetation.



Stormwater Wetlands

Stormwater wetlands are designed to use the water quality improvement functions similar to natural wetlands to treat and contain runoff. Wetlands can be designed to detain a portion of stormwater runoff for up to 24 hours after a storm to reduce downstream flooding and erosion. A shallow marsh is a common type of emergent wetland used for stormwater management. Wetlands provide aesthetic value as well as diverse habitat conditions.

Sand Filters

A sand filter is used to strain particulate matter from stormwater runoff through a horizontal bed of sand. The most common filtering media is sand, but other materials including peat/sand combinations and leaf compost material are also used. Filtration systems are designed mainly to provide water quality control.



Representative Stormwater Management Projects

The Olney Oaks Facility

The Olney Oaks facility is located in the Williamsburg subwatershed. The objective of this conceptual design is to improve water quality by retrofitting the existing pond's control structure to provide extended detention of the **1-year storm** event. The site is an existing stormwater management pond, which drains an area of approximately 397 acres. Two alternatives were evaluated to provide the maximum water quality benefit to the subwatershed:

1. Retrofit existing control structure to provide extended detention of the 1-year storm
2. Retrofit existing control structure to maximize water quality benefit

Alternative 2 was chosen because the pond maximizes the detention of the 1-year storm while minimizing the extent of modifications required. The estimated costs associated with constructing this alternative are kept to a minimum while achieving a significant increase in water quality through peak flow attenuation of all the design storms considered. Construction work will involve clearing trees or brush near the embankment and **riser**, and providing a trash rack that will capture trash washed into the pond during storms. This project is now at the 30% design stage.



Portion of Williamsburg Run located upstream of the Olney Oaks stormwater management pond riser. The Olney Oaks facility is located in the Williamsburg Run subwatershed



Site of Olney Oaks pond retrofit. The riser, which is part of the pond's control structure, will be modified, and is shown in the photos above and below



National Institutes of Health

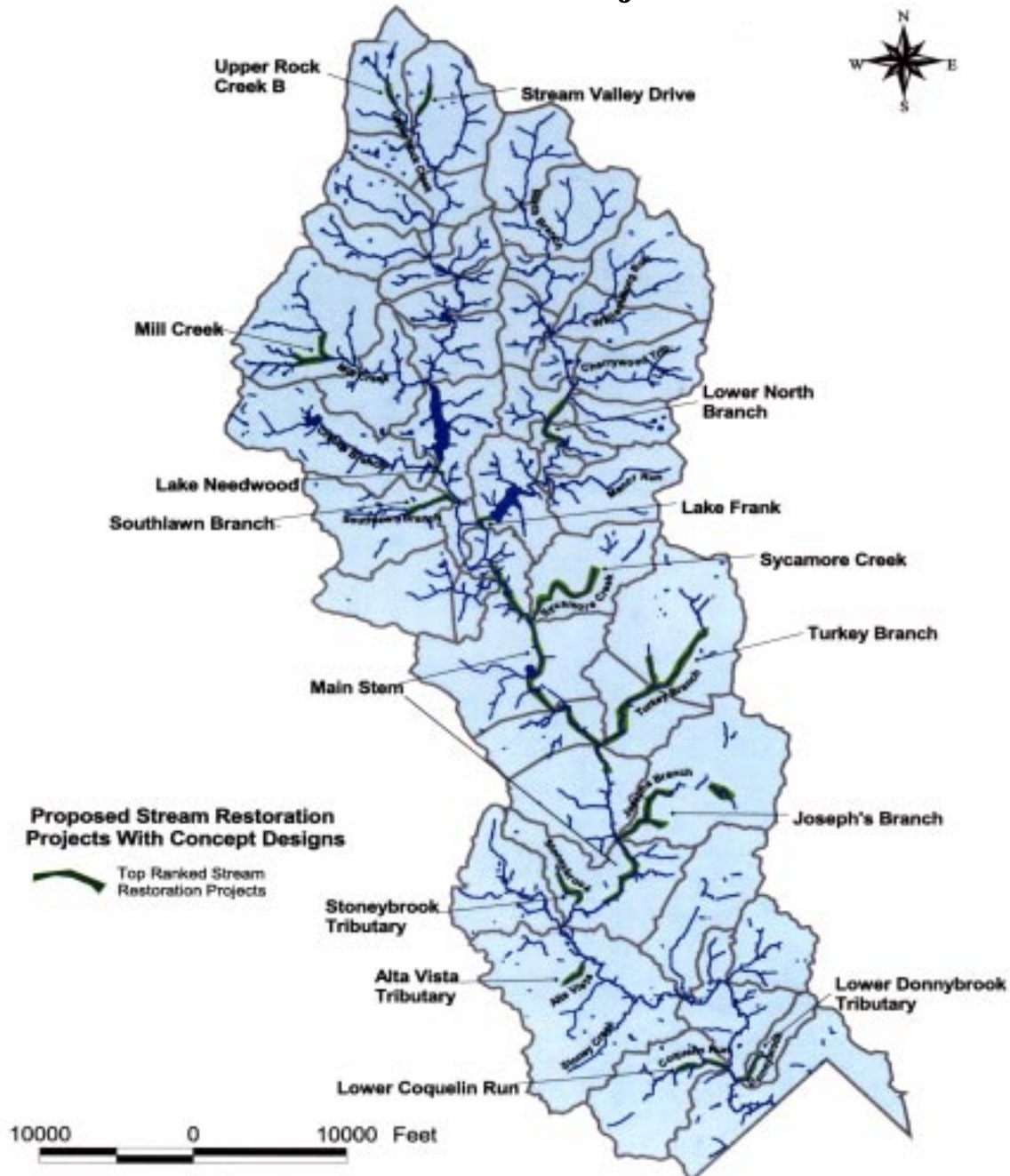
The National Institutes of Health stormwater management project, located in the Lower Main

Stem Bethesda subwatershed, is an important project because of the unique opportunity to control stormwater runoff from one of Montgomery County's most densely urbanized areas. This site will potentially control over 200 acres of runoff from the Bethesda Central Business District, which will provide great benefits to the Lower Rock Creek watershed.

Stream Restoration Projects

Based on the results of the stormwater management facility evaluation and stream habitat/water quality data, 23 stream restoration sites were chosen for concept design. Each site was ranked according to criteria such as cost, access to the site, impact on wetlands, and a **macroinvertebrate** study. The sites were chosen in order to maximize the effectiveness of stream restoration projects intended to address downstream habitat loss and erosion problems. Therefore, many of the stream restoration project sites are located downstream of a stormwater management project site, with the exception of several projects in the upper reaches of the watershed and along the main stem. Implementing the proposed stream restoration designs will help improve more than 3.8 miles of stream channel and increase habitat conditions within the 14 miles of stream reaches evaluated. The stream restoration designs outline steps to help restore channel banks and prevent further erosion.

Stream Restoration Project Sites



Stream Restoration Project Descriptions

<u>Proposed Site</u>	<u>Subwatershed Location</u>	<u>Upstream SWM Site</u>
Upper Rock Creek B	Upper Rock Creek	N/A
Stream Valley Drive	Upper Rock Creek	N/A
Mill Creek	Mill Creek	Mill Creek
Southlawn Branch	Southlawn Branch	Washington Gas
Lower North Branch	Lower North Branch	Cherrywood, Olney Oaks
Sycamore Creek	Sycamore Creek	N/A
Turkey Branch	Turkey Branch	Matt Henson 1& 2, Pepper Tree
Mainstem	Lower Mainstem	N/A
Joseph's Branch	Joseph's Branch	N/A
Stoneybrook Tributary	Lower Main Stem Ken Gar	Holy Cross
Alta Vista Tributary	Lower Main Stem Bethesda	N/A
Lower Donnybrook	Donnybrook Tributary	Rock Creek Pool & Tennis
Lower Coquelin Run	Coquelin Run	Dunlop

Updated project schedule information can be found at: www.askdep.com

What is Stream Restoration?

During stream restoration, equipment is used to carefully place rocks, logs, and native woody vegetation (such as black willow or silky dogwood) along eroded stream banks. These techniques incorporate woody vegetation with natural materials such as rocks and logs to prevent further damage to stream banks that are exposed and experiencing accelerated erosion during storm events. This helps to stabilize collapsing stream banks, and provides much needed shade over the streams. These techniques not only stabilize but create habitat for fish, aquatic insects, birds and other wildlife. Examples of stream restoration improvements include: **imbricated riprap**, riparian reforestation and plantings, **rootwads**, log and rock vanes, erosion control matting, removal of fish barriers and exotic species, grading, fascines, brush mattresses and **rock-pack** trees.



Live fascines (above) of willow cuttings stabilize the streambank, and an imbricated riprap revetment provides channel protection along channel bends (right).



This brush mattress provides erosion protection for the streambank using willow cuttings.



The rock vane above is designed to reduce flow velocity and create habitat.



Middle Turkey Branch Stream Restoration Project A Representative Site

This stream reach, which extends from Georgia Avenue to Connecticut Avenue, is in poor condition with severe erosion. Three exposed sewer pipes were observed along the reach, most likely caused by down-cutting of the stream channel. Two stormwater outfalls release water into the stream from an elevated population, creating pools below. Aquatic and riparian habitat is in fair condition, and no wildlife was observed in the area. Sedimentation has occurred and the stream continues to show susceptibility to erosion and deposition from high flow velocities. The proposed improvement of stormwater management sites at Matt Henson 1 and Matt Henson 2 in the upstream portion of this reach should help alleviate some of the problems from high flow volumes.

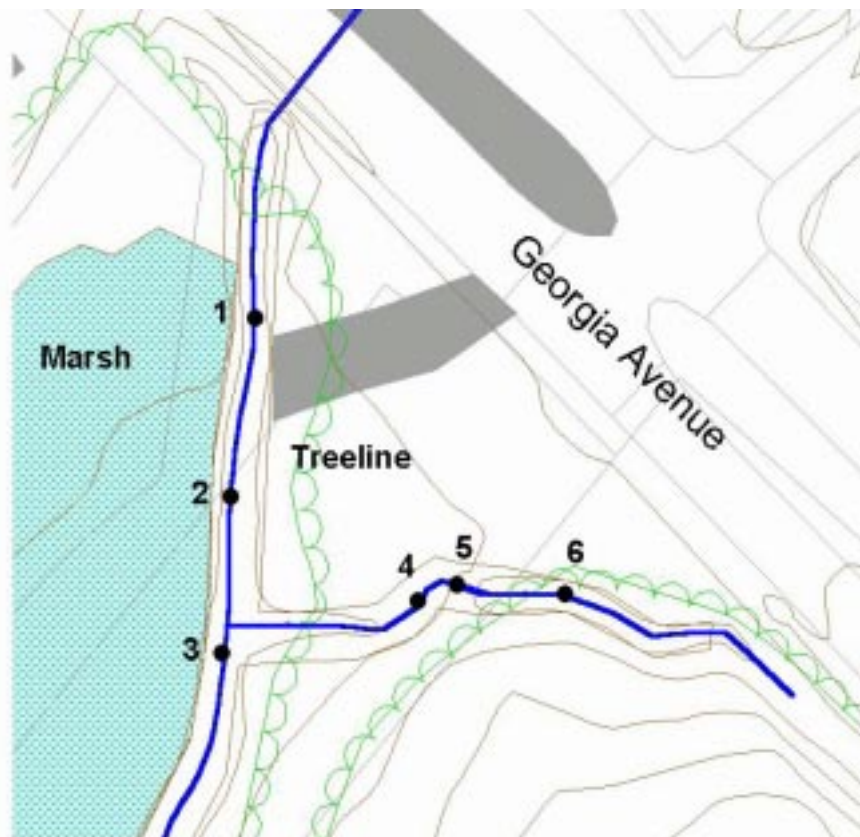


Middle Turkey Branch has areas of severe erosion and sedimentation. These photos were taken near the Matt Henson 2 stormwater wetland



The proposed conceptual design for this stream reach includes 25 design points. The proposed improvements include: slope protection, excavation of point bar, wing deflectors, flush cut trees, rootwads and imbricated riprap.

Middle Turkey Branch Stream Restoration Concept Design



The concept design to the left shows a portion of the Middle Turkey Branch stream restoration project. Each number represents a section of stream which will be restored, and the proposed actions for each design point are listed below.

1. Plant 15' buffer on bank, remove debris in stream
2. Plant buffer
3. Log pack Tulip Poplar and bank, add plants, fill behind logs, remove tree and use as log pack, remove bamboo and replace with natives
4. Replace stone at toe, grade bank, fill around tree to protect rock pack tree
5. Pull tree out of stream, put rootwad in bank
6. Pack stone at toe, use stone to protect pool

Rock Creek Action Plan Project Status

The currently active stormwater management and stream restoration projects are listed below. These projects are all funded by a combination of County funds and grants from State and Federal agencies. Projects followed by a * are currently funded by grants. The remaining top-ranked projects are pending until funding can be secured. The County is partnering with Maryland- National Capital Park and Planning Commission to implement these plans.

Currently Active Projects

Stormwater Management

Pepper Tree*

Matt Henson No. 1*

Matt Henson No. 2*

Dunlop *

National Institutes of Health*

Olney Oaks

Stream Restoration

Turkey Branch*

Joseph's Branch*

Sycamore Creek*

Stream Valley Drive*

Lower Coquelin Run*

Alta Vista

Ken Gar Palisades

Pending Projects

Stormwater Management

Rock Creek Pool and Tennis

Holy Cross

Washington Gas

Mill Creek

Stream Restoration

Lower Donnybrook

Upper Rock Creek

Stoneybrook

Mainstem

Lower North Branch

Lake Needwood

Mill Creek

Lake Frank

Southlawn

Other Projects in Rock Creek Watershed

MCDEP has applied for a grant to remove fish passage barriers, and identify **vernal pool** creation/enhancement opportunities and opportunities to create stormwater wetlands in Rock Creek. The work is in cooperation with Maryland -National Capital Park and Planning Commission and Maryland Department of Natural Resources.

Monitoring

- MCDEP will be updating the baseline biological monitoring and habitat assessment in the year 2003 for the Rock Creek watershed within Montgomery County.
- Environmental consultants will be performing pre- and post- construction monitoring of stream restoration projects, wetlands, and stormwater management facilities.

Public Involvement



Public involvement is essential in the restoration of Rock Creek. For all active projects, public meetings were held to get comments from watershed citizens, and a site or stream walk was conducted with the public to review the proposed project and discuss any questions or concerns. Citizens and students are also active in the watershed with Stream Teams, adopting a tributary of Rock Creek, tree planting projects, storm drain stenciling, stream cleanups, volunteer monitoring and more. For information on education and volunteer opportunities in the Rock Creek watershed contact Diane Davis at **240-777-7714**

What Can You Do To Help?

There are many actions that citizens of Rock Creek watershed can take to help protect and restore Rock Creek. In addition to donating time or expertise to one of the many volunteer programs in the watershed, there are specific actions a person can take at home or work to reduce the amount of runoff and pollution that enters the streams of Rock Creek watershed. While the stormwater management and stream restoration projects are excellent ways to protect and restore the watershed, the collective actions of individuals can also make an enormous difference. Listed below are some ways to help protect Rock Creek.

Pollution Prevention At Home

Lawns & Landscaping



Convert part of your lawn to native vegetation and/or use native plants in landscaping because they are hardier and are more tolerant of pests. If you do have a lawn, make sure you do a soil test to see how much, if any, fertilizer your lawn needs. Use organic fertilizers and apply sparingly; you can make your own fertilizer by collecting and composting yard waste. Or, simply leave grass clippings on the lawn. Select alternative pest control measures such as integrated pest management (see page 14) first. If a pesticide is needed, apply it at the correct

time and rate. If you must use chemicals or fertilizer, check the weather forecast for rain so they don't wash away. Keep fertilizers and pesticides off sidewalks and driveways.

Rooftop Runoff

Redirect your downspout so that rooftop runoff drains to a pervious surface such as a lawn or other vegetated area. If you do not have well-drained soil, you can direct the runoff to a **french drain** or **dry well**. Or, use a rainbarrel to store the water for later use in irrigation or household cleaning.

Pet Waste

Animal waste adds both nutrients and harmful bacteria to local waters, especially in populated areas where there are high numbers of pets in a small area. So pick up after your pets! Flush your dog waste, or wrap it in plastic and put it in the trash.

Septic Systems

Keep your septic system clean and maintained. Most septic systems should be pumped out once every 3-5 years. Put only water, low-phosphate organics, food waste and human waste down your drains. Minimize use of caustic and chlorine products, as these may kill the essential bacteria that break down the sewage in your septic tank.

Car Maintenance



Home car washing can be a major contributor to phosphorus pollution as a result of soapy water running into storm drains and carrying with it soap, oil, sludge and road film. Wash your car on your grass instead of in your driveway, and use non-phosphate soaps. Or take it to a commercial car wash that treats its wastewater. Also, be careful when changing your oil or other fluids, clean up spills right away, and take used motor oil to a recycling center.

Pollution Prevention Tips

Where to buy eco-friendly products

Large capacity compost bins are available for under \$10 from Montgomery County Division of Solid Waste Services: **240-777-6400**. Rainbarrels can be purchased for



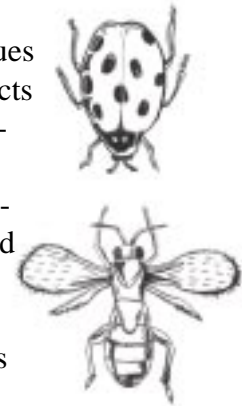
\$125-\$150 from www.burpee.com or www.gardeners.com or make your own with the help of Maryland DNR: www.dnr.state.md.us/programs/greenbuilding/rainbarrel.html. Low phosphate soaps and fertilizers can be purchased from www.co.mo.md.us/dep/IPM/products.html

Safe alternatives for household cleaners

Many common household products are harmful to septic systems and may be a significant source of water pollution. Fortunately, there are safe and readily available alternatives to these chemicals. For example: borax is a good substitute for bleach, lemons or baking soda can be used in place of a garbage disposal deodorizer, and a vinegar and water mixture makes a good substitute for window cleaner.

Integrated pest management

Integrated pest management (IPM) is a holistic approach to pest control that uses biological or mechanical controls rather than relying on toxic chemicals. Techniques include crop rotation, companion plants, **trap crops**, netting, using beneficial insects for pest control, horticultural oils and many others. Here are some IPM tips: Companion plants in your garden will attract beneficial and predatory insects to your plants while repelling unwanted garden thugs. For example: marigolds repel nematodes, sweet basil repels aphids, mosquitoes, and mites, while coriander, fennel and sweet alyssum attract beneficial braconid wasps, and cosmos, fennel and Queen Anne's Lace attract the beneficial lacewings, ladybird beetles, and hover flies. Ladybird beetles can be used to control aphid infestations while the preying mantis will eat many common garden pests. For more information about integrated pest management go to www.co.mo.md.us/dep/IPM/home.html



Native versus non-native plants

Non-native plants are those which have been introduced from another region. Non-native species such as kudzu, multiflora rose, bamboo and garlic mustard are invasive and outcompete many native species. Replacing invasive species with native plants for landscaping increases plant diversity, and is relatively easy to do because native plants require little maintenance since they are adapted to the local climate. Some recommended native plants for Maryland are listed below.

Shade Trees

White oak *Quercus alba*

Tupelo *Nyssa sylvatica*

Red Maple *Acer rubrum*

Black Walnut *Juglans nigra*

Eastern Red Cedar *Juniperus virginiana*

Trees and Shrubs for Hedges

American hazelnut *Corylus Americana*

Arrow-wood viburnum *Viburnum dentatum*

Ornamental Vines

American bittersweet *Celastrus scandens*

Trumpet honeysuckle *Lonicera sempervirens*



Shrubs

Spicebush *Lindera benzoin*

Wild hydrangea *Hydrangea arborescens*

Grasses

Indian grass *Sorghastrum nutans*

Wild oats *Uniola latifolia*

Ground Covers

Golden ragwort *Senecio aureus*

Allegheny spurge *Pachysandra procumbens*

Wetland Plants for Water Gardens

Cardinal flower *Lobelia cardinalis*

Pickeralweed *Pontederia cordata*

For a complete list of Maryland native plants, go to www.askdep.com or write to the Maryland Native Plant Society, P.O. Box 4877, Silver Spring, MD 20914.

Who To Call If You Have A Water Pollution Question or Problem

Inter-County Agencies

Maryland -National Capital Park and Planning Commission (MNCPPC)

Erosion - stream banks on parkland 301-495-2535

Trash and debris in parks and streams 301-495-2535

Washington Suburban Sanitary Commission (WSSC)

Discolored or odorous drinking water 301-206-4002

Sanitary sewer problems 301-206-4002

Maryland State Agencies

Maryland Department of the Environment (MDE)

Emergency Response (e.g., spills, discharges) 410-631-3937

Fish kills 410-974-3238

Maryland Environmental Services (MES)

Oil and antifreeze recycling locations 800-473-2925

Department of Natural Resources (DNR)

Illegal dumping on state park land 301-924-2127

Montgomery County Agencies

Department of Environmental Protection (DEP)

Division of Environmental Policy and Compliance (DEPC)

Illegal dumping hotline 240-777-7700(day)

Stormwater management, pond and safety maintenance 240-777-7744

Water pollution 240-777-7770

Watershed Management Division (WMD)

Stream cleanups 240-777-7712

Department of Permitting Services (DPS)

Land Developing Services (LDS)

Sediment from construction site entering streams 240-777-6366

Stormwater Management (SWM)

Stormwater management and sediment control plan review issues 240-777-6320

Wells and Septic (WS)

Septic leaks/septic tanks 240-777-6300

Department of Public Works and Transportation (DPWT)

Blocked storm drain, inlet of pipe or erosion from public storm drain 240-777-ROAD



**24 hour illegal dumping
hotline: 240-777-7788 or
240-777-DUMP**



For more information about the Rock Creek Watershed Restoration Action Plan, or for copies of this publication, please contact Scott Randall of MCDEP at **240-777-7712** or go to www.askdep.com

Glossary

Anadromous fish: A fish that spends all or part of its adult life in salt water and returns to freshwater stream and rivers to spawn

Dry Well: An infiltration practice designed to treat rooftop runoff by directing runoff to a trench for percolation into groundwater via a downspout

Erosion: The wearing away of rock or soil by the gradual detachment of particles by water, wind, ice or other mechanical or biological forces

French Drain: A gravel-filled trench with a perforated pipe in the bottom that is placed below the ground surface to drain a yard

Imperviousness: The percentage of impervious cover (surfaces such as roads, parking lots buildings and driveways) within a development site or watershed

Macroinvertebrate: Aquatic insects large enough to be seen by the unaided eye that live in or on the bottom of a body of water

Mainstem: A stream reach with the highest stream order (largest number of tributaries) in a watershed or subwatershed

Native vegetation: Vegetation that is indigenous to an area and adapted to local conditions

Nonpoint source pollution: Nonpoint source pollution comes from many diffuse sources, and pollutants are carried by rainfall or groundwater moving over and through the ground

One-year storm: A stormwater event that occurs on average once a year or statistically has a 100% chance on average of occurring in a given year (in Montgomery County, the 1-yr storm is 2.6 inches of rainfall in 24 hours)

Retrofit: An expansion or renovation of an existing stormwater management facility

Riprap: Randomly placed rock used to protect streambanks from erosion

Riser: A vertical pipe which extends from the bottom of a pond stormwater practice and houses the control devices to achieve the discharge rates for specified design

Rock pack: A technique used to stabilize trees along streambanks that involves packing rocks underneath and around the tree roots

Rootwad: The lowermost portion of a tree trunk with the root mass attached

Sedimentation: Occurs when soil particles suspended in stormwater settle in stream beds, often disrupting the natural flow of the stream

Stormwater management: Measures taken to limit the amount of stormwater runoff from impervious surfaces. These measures include man-made ponds, created wetlands, infiltration facilities, etc.

Subwatershed: A smaller geographic section of a larger watershed unit with a drainage area of between 2 and 15 square miles and whose boundaries include all the land area draining to a point where two second order streams combine to form a third order stream

Trap Crop: A crop planted along garden perimeters to attract pests and distract them from the real crops

Vernal pool: An ephemeral or temporary isolated depression which fills with water and is a primary breeding area for amphibians

Watershed: All the land area which contributes runoff to a particular point along a waterway










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Rock Creek Restoration Project Schedule Addendum Fall 2001

Stormwater Management

Project	Current Design Status	Timeline					
		Winter 2001-2002	Spring 2002	Summer 2002	Fall 2002	Winter 2002-2003	Spring 2003
Matthew Henson #1 (New Facility)	60% 	Complete Designs	Permitting	Construction			
Matthew Henson #2 (New Facility)	60% 	Complete Designs	Permitting	Construction			
Peppertree (Retrofit existing pond)	60% 	Complete Designs	Permitting	Construction			
Dunlop (New Facility)	30% 			Complete Designs	Permitting	Construction	
Ken Gar (New Facility)	30% 			Complete Designs	Permitting	Construction	
Olney Oaks (Retrofit existing pond)	30% 			Complete Designs	Permitting	Construction	
NIH (New Facility)	20% 				Complete Designs	Permitting	Construction

*Project map can be found on page 6

Note: Other projects are at concept design and will be added to the schedule when final design is scheduled.